
Associated conference: “Yes we can!” - Digital Education for Better Futures (EDEN 2023 Annual Conference)

Conference location: Dublin City University (DCU), Dublin, Ireland

Conference date: 18-20 June 2023

How to cite: Cefa, B., & Zawacki-Richer, O. Mapping the Dropout Phenomenon for the New Digital Context 2023 *Ubiquity Proceedings*, 3(1): 444-451. DOI: <https://doi.org/10.5334/uproc.121>

Published on: 27 October 2023

Copyright: © 2023 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/4.0/>.

UBIQUITY PROCEEDINGS



<https://ubiquityproceedings.com>

MAPPING THE DROPOUT PHENOMENON FOR THE NEW DIGITAL CONTEXT

Berrin Cefa, University of Oldenburg, Germany

Olaf Zawacki-Richter, University of Oldenburg, Germany

Correspondence: *Berrin Cefa Sari: berrin.cefa.sari@uni-oldenburg.de*

Abstract

Open, distance, and digital education (ODDE) has a long history concerning dropout. With the new reality of the digital age, the terminologies and concepts that have been long adopted are inevitably subject to change. To understand dropout in the digital transformation, it is important to take an evidence-based approach and examine the literature. Therefore, this study applies the steps of a systematic literature review to retrieve relevant articles on dropout since 2010 and conducts a content analysis via text mining. The results indicate that student dropout and retention declined in publication during the pandemic despite remaining one of the critical issues in higher education. The main concepts indicate that most of the dropout studies focus on comparisons between face-to-face and online modalities; the learning environment and engagement; and support and motivation.

Keywords:

Dropout, student retention, distance education, open education, online education

Introduction

Student attrition has been a major area of concern in higher education (HE) throughout the years and various theoretical models have explored the dimensions and factors that result in student retention or attrition (Rovai, 2003; Spady, 1970; Tinto, 1975). However, open and distance education, and subsequently online education, made the dropout phenomenon a central point because student-attrition rates have long been reported as higher than in face-to-face, on-campus education (Simpson, 2013; Smith, 2010). According to the traditional definition, dropout is the failure of an individual to continue their engagement in the registered programme and disengagement from the academic institution as a result of socially and/or academically unfavourable experiences (Tinto, 1975).

As the advancement of technology-driven education and the demand for HE continue to grow (Arnhold & Bassett, 2021), the context is subject to change, too. The long-established binary position of brick-and-mortar institutions versus distance education is becoming blurred as technology-driven education continues to advance. The rapidly increasing speed of technological development has made digital education, either online or technology-enhanced, a preferred option in higher education (Allen & Seeman, 2017). Online or distance learning has become a viable option for HE institutions looking for prevalence in more and wider student retention (Nakamura, 2017). The Covid-19 pandemic has further propelled this trend and proved that teaching through online modalities is a resilient option amidst the crisis. Although there are numerous publications that report the difficulties and limits of online education, digital learning and new developments around generative AI technologies continue to reshape education.

Within this transformation, it is important to sustain the quality of higher education and improve student retention, which is one of the quality criteria of HE. However, it is questionable if the old definitions of retention and dropout are still valid in the current technological landscape. Facilitating up-to-date and valid terminology for the field of ODDE is highly important to explore current practices. To achieve this goal, it is crucial to attain an in-depth understanding of the dropout phenomenon first and map the phenomenon with evidence from the literature. This study serves as a preliminary analysis of a literature review corpus from 2010 onwards. The year 2010 was taken as a starting point for the spread of online education to wider communities through various advancements such as massive open, online courses (MOOCs) and open education resources (OER; Zawacki-Richter & Naidu, 2016).

Within the given frame, this study aims to map the dropout terrain according to the thematic clusters to answer the following questions:

- How are publications on dropout between 2010 and 2022 distributed according to years and journals?
- What is the thematic scope in the field of drop-out research and how do the themes relate to each other?

This study focuses on the reasons, factors, or results that affect dropout or student retention among undergraduate or master's level students. The exploration and mapping of how the dropout phenomenon is addressed in the literature is formed according to the PICO framework (Boland et al., 2017). The dropout context is framed with HE including any ODDE setting. MOOCs are excluded as long as they are not offered as a part of formal education.

Methodology

Method and Sample

Analyses of trends and conceptual themes are important to picture the progress of a certain phenomenon and make evidence-supported projections about the field of the studied subject (Lee et al., 2004). A good example of this is a content analysis by Zawacki-Richter and Naidu (2016), in which they map three decades of distance-education literature. Exploring the thematic clusters based on large body of texts enables a broad understanding of trends and themes within the field under investigation (Krippendorff, 2013). A crucial point of the method is the need for well-informed interpretation of the data. With this aim, this paper adopts content analysis of systematically selected literature on student dropout and retention between January 2010 and December 2022. Content analysis is a labour-intensive process as it requires the validation of codebooks, glossaries, and inter-rater reliability as these factors increase the risk of bias of the authors. Therefore, an automated content analysis tool, Leximancer, is used as the text mining tool. This text-mining approach has been used to decrease interpreter coding bias, generate automated semantic relations and outline the most-discussed themes in connection to the phenomenon under study.

As the reproducibility and replicability of such methods are crucial in research (Smith & Humphreys, 2006, p. 262) and as the articles assessed here are not limited to a single journal, the methods of a systematic review were adopted to form the data set. Systematic reviews have three main, consecutive steps, namely: a) identification of the major research publications, b) critical appraisal of the obtained studies, c) synthesis of findings in the final corpus based on the evidence (Gough et al., 2012). Such analyses can enrich the literature by providing information on the selected study field and guidance for future studies and directions (Petticrew & Roberts, 2008).

Data were retrieved from three databases of the educational technology field, namely Education Source, Scopus, and Web of Science, using the search string given in Table 1 and the inclusion and exclusion criteria given in Table 2.

Table 1

Search String

| Concepts | Search terms with Boolean operators |
|------------------|--|
| Dropout | (dropout OR drop-out OR retention OR persistence OR attrition OR disengage*) N5 student* |
| Digital context | AND (online* OR distanc* OR blend* OR mobile OR technology-enhance*) N3 (learn* OR teach* OR study* OR studie* OR degree) |
| Higher education | AND "higher education" OR universit* OR college* OR "postsecondary education" OR "tertiary education" OR undergrad* OR postgrad* |

Table 2

Inclusion and Exclusion Criteria

| Inclusion | Exclusion |
|---|--|
| English | Not in English |
| Journal articles | Editorials, books, book chapters, conference proceedings, introductions, reviews, grey literature |
| Empirical research | Literature reviews, conceptual papers |
| Digital higher education, distance, open, online, hybrid, or blended learning | face to face only, MOOCs that are not a part of a formal university programme |
| Undergraduate students, master's students | K-12, PhD students, adult learners in lifelong learning programmes |
| Papers report on student retention, attrition, persistence, dropout | Papers report a sub-dimension of retention or dropout phenomenon without direct link to dropout or retention |

The initial corpus after elimination of duplicates ($N = 2426$) was screened based on the abstracts. Before the abstract screening, inter-rater reliability between three raters was calculated ($k = .70$), resulting in good agreement. Of these abstracts screened, 669 articles were selected for full-text screening. Of these, the studies that were not retrieved for full texts ($n = 33$) were removed. After the final exclusion and inclusion assessment and further exclusions ($n = 352$), the abstracts of 287 studies were found eligible for this study and included for further analysis.

The titles and abstracts of the 287 included articles were used for text mining as they present the purpose, population, and main results of the studies in detail and in condensed form. As the data was extracted automatically from the original CSV file of the included studies, they were checked for and cleaned by removing stopwords as well as words, lexicons and/or expressions irrelevant to the analysis (e.g., automatic indication of copyright).

Limitations

This study is limited to journal articles, three databases, and English only publications. Although the selection of data was subject to wide inclusion of three big databases that include high ranking journals, the publication of journal articles is limited by the editorial processes and the scope of the journals. In addition, conference papers and book chapters were not included. MOOCs, unless a part of a formal degree programmes are also excluded from this study as the reasons for dropping out from MOOCs are diverse and may not show the same pattern of disengagement from institutional, formal-learning environments. Although Leximancer has been found to produce valid evidence for content analysis (e.g., Zawacki-Richter & Naidu, 2016), it "...is not a panacea and requires analytical sensitivity and judgment in its interpretation." (Harwood et al., 2015, p. 1041).

Findings and Discussion

Descriptive results

Figure 1 shows the trend of publications from 2010 to 2022:

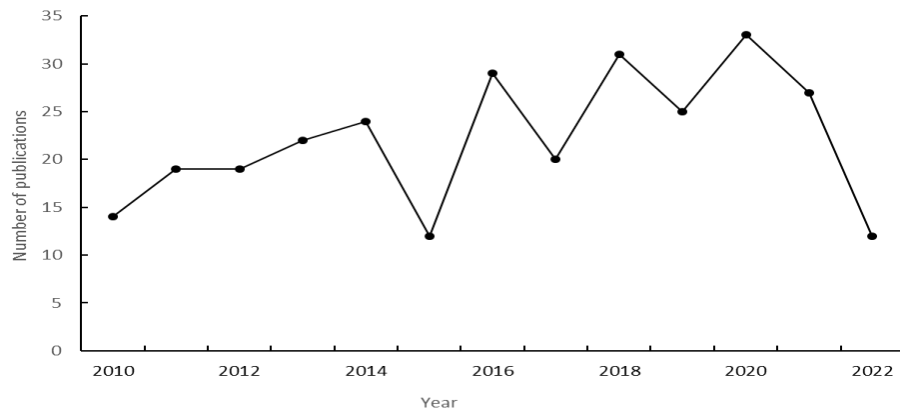


Figure 1. Publications per year

The publication trend per year reveals interesting results regarding its slightly fluctuating but generally increasing line until 2020. From the year 2020 on, there is a notable decline, which may be due to several reasons. The publication interest during the pandemic (2020-2022) may have shifted to more acute problems due to emergency remote teaching practices such as equality, inclusive education, and other constraints being experienced.

The included articles came from 133 different journals, with those contributing more articles from the field of ODDE. Online Journal of Distance Learning Administration ranks first ($n = 12$), followed by Online Learning ($n = 10$), Journal of Educators Online ($n = 9$), International Review of Research in Open & Distance Learning ($n = 8$), and Distance Education ($n = 8$). The list of the top ten journals is presented in Table 3.

Table 3

Number of included articles per journal

| Journal | Number of Articles |
|---|--------------------|
| Online Journal of Distance Learning Administration | 12 |
| Online Learning | 10 |
| Journal of Educators Online | 9 |
| International Review of Research in Open & Distance Learning | 8 |
| Distance Education | 8 |
| Computers & Education | 7 |
| Open Learning | 7 |
| American Journal of Distance Education | 6 |
| Internet & Higher Education | 6 |
| Journal of College Student Retention: Research, Theory & Practice | 6 |

The majority of articles on drop-out and retention was published in journals with a management and institution focus. Based on the 3M-Framework, which groups research themes in three layers of micro, meso, and macro levels (Zawacki-Richter, 2009, Zawacki-Richter & Bozkurt, 2023), the dropout issue is considered on the meso-level of HE institutions. Drop-out and student retention rates are widely considered connected to institutional quality assurance and management strategies, which is also a meso-level issue.

The scope of dropout phenomenon (2010 - 2022)

The first analysis was run for the whole corpus including all 287 papers based on titles and abstracts. Figure 2 displays the major themes and concepts covered in the articles published between 2010 and 2022.

medium such as learning management systems or dashboards that provide information about teaching and learning activities in the online environment. The corpus covers several examples on early warning systems (e.g., Bañeres et al., 2020; Kustitskaya, et al., 2022), the use of dashboards (e.g., Marshall, 2016); and predictive learning analytics (e.g., Herodotou, et al., 2020; Yasmin, 2013).

Finally, the concept of *motivation* is related to *persistence* in learning. Motivation may be due to internal or external factors of the individual learners (Price & Kadi-Hanifi, 2011). Thus, it is not directly linked to institutional measures of *support* in the concept map. Still, motivational intervention programs are in use through predictive learning analytics (e.g., Herodotou, et al., 2020). More importantly, *motivation* demonstrates the social interaction in the circle, which is highly motivational (Waite & Davis, 2006). Technology-enhanced media and digital learning tools have long enabled rich social-learning environments (Barlow, 2008; Price & Kadi-Hanifi, 2011).

Conclusion and future directions

This study analyzed the content of titles and abstracts of systematically collected journal articles with a text-mining tool and provided an overview of the themes, concepts, and semantic relations among the concepts..

The findings demonstrate that the dropout and student-retention literature discusses the high attrition rates in distance education, the common understanding of success as course completion, the need for support at the institutional level (*meso*) through information gathered at the teaching and learning (*micro*) level. The map also displays engagement, satisfaction, and academic strategies as topics related to retention.

This study contributes to ODDE literature by mapping the last thirteen years of publications gathered through three large databases that host high-quality, peer-reviewed journals and filtering the results to retention and dropout studies with replicable, reproducible data curation methods. However, there is still need for further research.

Student retention is considered a quality indicator (Burke, 2019) and being financially better for the institutions and government (Simpson, 2005). In addition to global crisis, new advances in the digital world are forcing HE to transform. These issues include, generative AI, advanced access to the technology in the global North, a growing digital divide between the Global South and North, and the need for effective teaching and learning strategies through hybrid learning environments. Further analysis and comparison studies should be conducted to see whether the trends in dropout research differ or vary based on a) period of time of the publications, b) digital divide-related research, and c) digital transformation-based research. Thus, a new understanding and problematization of dropout phenomenon should be developed and discussed.

References

- Allen, I. E., & Seaman, J. (2017). Digital Learning Compass: Distance Education Enrollment Report 2017. Retrieved from <https://files.eric.ed.gov/fulltext/ED580868.pdf>.
- Aljohani, O. (2016). A Review of the Contemporary International Literature on Student Retention in Higher Education. *International Journal of Education and Literacy Studies*, 4(1), 40-52.
- Arnhold, N. & Bassett, R. M. (2021). *Steering tertiary education: Toward resilient systems that deliver for all*. Washington DC: World Bank.
- Ashby, J., Sadera, W. A., & McNary, S. W. (2011). Comparing student success between developmental math courses offered online, blended, and face-to-face. *Journal of Interactive Online Learning*, 10(3), 128–140. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84855766000&partnerID=40&md5=b41eb555c431319c49667b574a48e2f6>

- Bañeres, D., Rodríguez, M. E., Guerrero-Roldán, A. E., & Karadeniz, A. (2020). An early warning system to detect at-risk students in online higher education. *Applied Sciences (Switzerland)*, 10(13), 1–28. <https://doi.org/10.3390/app10134427>
- Barlow, T. (2008). Web 2.0: Creating a classroom without walls. *Teaching Science* 54(1), 46–8.
- Berger, J., Blanco Ramírez, G., & Lyons, S. (2012). Past to present: A historical look at retention. *College Student Retention: Formula for Student Success*, 7–34.
- Bodin, R., and S. Orange. 2018. Access and retention in French higher education: Student drop-out as a form of regulation. *British Journal of Sociology of Education*, 39(1), 126–43.
- Boland, A., Cherry, M. G., & Dickson, R. (2017). *Doing a systematic review: A student's guide* (2nd edition). Thousand Oaks, CA: SAGE Publications.
- Brindley, J. E., & Paul, R. (1996). Lessons from distance education for the university of the future. In R. Mills & A. Tait (Eds.), *Supporting the learner in open and distance learning* (pp. 43–55). Pitman Publishing.
- Burke, A. (2019). Student retention models in higher education: A literature review. *College and University*, 94(2), 12-21.
- Clayton, K.; Blumberg, F.; Auld, D.P. (2010). The relationship between motivation, learning strategies and choice of environment whether traditional or including an online component. *British Journal of Educational Technology*, 41, 349–364
- Ferguson, S. (2020). Attrition in online and face-to-face calculus and precalculus courses: A comparative analysis. *Journal of Educators Online*, 17(1), 1–8. <http://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=142286978&site=ehost-live>
- Gough, D., Oliver, S., & Thomas, J. (Eds.). (2012). *An introduction to systematic reviews*. London; Thousand Oaks, Calif: SAGE
- Harwood, I. A., Gapp, R. P., & Stewart, H. J. (2015). Cross-check for completeness: Exploring a novel use of Leximancer in a grounded theory study. *The Qualitative Report*, 20(7), 1029
- Herodotou, C., Naydenova, G., Boroowa, A., Gilmour, A., & Rienties, B. (2020). How can predictive learning analytics and motivational interventions increase student retention and enhance administrative support in distance education? *Journal of Learning Analytics*, 7(2), 72–83. <http://dx.doi.org/10.18608/jla.2020.72.4>
- Krippendorff, K. (2013). *Content analysis: An introduction to its methodology* (3rd ed.). Los Angeles, CA: Sage.
- Lee, Y., Driscoll, M. P., & Nelson, D. W. (2004). The past, present, and future of research in distance education: Results of a content analysis. *American Journal of Distance Education*, 18, 225–241. doi:http://dx.doi.org/10.1207/s15389286ajde1804_4.
- Marshall, J. (2016). Online course selection: Using course dashboards to inform student enrollment decisions. *Open Learning*, 31(3), 245–259. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84986182693&doi=10.1080%2f02680513.2016.1227699&partnerID=40&md5=db793bdeede4e4d78194771472310e44>
- Matcha, W., Gasevic, D., Uzir, N. A. A., Jovanovic, J., Pardo, A., Lim, L., ... & Tsai, Y. S. (2020). Analytics of Learning Strategies: Role of Course Design and Delivery Modality. *Journal of Learning Analytics*, 7(2), 45-71.
- Nakamura, M. (2017). The state of distance education in Japan. *Quarterly Review of Distance Education*, 18(3), 75–87.
- Parr, C. (2013). MOOC Completion Rates 'Below 7 %'. Available at: <http://www.timeshighereducation.co.uk/news/mooc-completion-rates-below-7/2003710.article>.
- Pechenkina, E., Laurence, D., Oates, G., Eldridge, D., & Hunter, D. (2017). Using a gamified mobile app to increase student engagement, retention and academic achievement. *International Journal of Educational Technology in Higher Education*, 14(1), 1–12. <http://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=124485246&site=ehost-live>
- Petticrew, M., & Roberts, H. (2008). *Systematic reviews in the social sciences: A practical guide*. Oxford, The UK: Blackwell Publishing.

- Radovan, M. (2019). Should I stay, or Should I go? Revisiting Learner retention models in distance education. *Turkish Online Journal of Distance Education*, 20(3), 29–40. <https://doi.org/10.17718/tojde.598211>
- Rahim, N. B. (2020). Improving Student Engagement and Behavioural Outcomes via Persistence among Distance Learners. *Akademika*, 90(2), 91–102.
- Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *Internet and Higher Education*, 6, 1-16. [https://doi.org/10.1016/S1096-7516\(02\)00158-6](https://doi.org/10.1016/S1096-7516(02)00158-6)
- Simpson, O. (2005). The costs and benefits of student retention for students, institutions and governments. *Studies in Learning, Evaluation Innovation and Development*, 2(3), 34-43.
- Simpson, O. (2013). Student retention in distance education: are we failing our students?. *Open learning: The Journal of Open, Distance and e-learning*, 28(2), 105-119.
- Smith, A. E., & Humphreys, M. S. (2006). Evaluation of unsupervised semantic mapping of natural language with Leximancer concept mapping. *Behavior Research Methods*, 38, 262–279. doi:<http://dx.doi.org/10.3758/BF03192778>.
- Smith B. (2010). E-learning technologies: A comparative study of adult learners enrolled on blended and online campuses engaging in a virtual classroom (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database.
- Spady, W. 1970. Dropouts from higher education: An interdisciplinary review and synthesis. *Interchange*. 1(1), 64–85.
- Summers, J.J.; Waigandt, A.; Whittaker, T.A. A. (2005). Comparison of Student Achievement and Satisfaction in an Online Versus a Traditional Face-to-Face Statistics Class. *Innov. High. Educ.*,29, 233–250.
- Tinto, V. 1975. Dropout from higher education: A theoretical synthesis of recent research. *The Review of Educational Research*. 45(1): 89–125.
- Waite, S., & B. Davis. (2006). Developing undergraduate research skills in a faculty of education: Motivation through collaboration. *Higher Education Research and Development* 25(4). 403–19.
- Xavier, M., & Meneses, J. (2020). *Dropout in online higher education: A scoping review from 2014 to 2018*. eLearn Center Universitat Oberta de Catalunya.
- Zawacki-Richter, O. (2009). Research areas in distance education: A Delphi study. *The International Review of Research in Open and Distributed Learning*, 10(3). <https://doi.org/10.19173/irrodl.v10i3.674>
- Zawacki-Richter, O., & Bozkurt, A. (2023). Research Trends in Open, Distance, and Digital Education. In O. Zawacki-Richter & I. Jung (Eds.), *Handbook of Open, Distance and Digital Education* (pp. 199–220). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-2080-6_12
- Zawacki-Richter, O., & Naidu, S. (2016). Mapping research trends from 35 years of publications in distance education. *Distance Education*, 37(3), 245–269. <https://doi.org/10.1080/01587919.2016.1185079>.